

What is claimed is:

1. An optical disc including a data area, a time map area, and a program chain area, wherein

the data area records a video object that includes a plurality of data units, each of which contains at least one picture,

the time map area records a table showing recording addresses of data units, the addresses corresponding to a plurality of reproduction times that belong to a period during which the video object is reproduced, each of the data units containing a picture to be reproduced at a corresponding one of the plurality of reproduction times, and

the program chain area records a plurality of sets of cell information, each of which includes a start time and an end time which are used to identify a reproduction section in the video object, the plurality of sets of cell information being recorded in correspondence with reproduction orders.

2. The optical disc of Claim 1, wherein

the table further records difference times, each of which corresponds to one of the plurality of reproduction times and is a difference between the one of the plurality of reproduction times and a reproduction time of the first picture of a data unit that includes a picture to be reproduced at the one of the plurality of reproduction times.

3. A recording apparatus for recording video data onto an optical disc, comprising:

an input unit operable to receive input video data to be recorded;

a compressing unit operable to compress the input video

data and generate a video object containing a plurality of data units;

a writing unit operable to write data onto the optical disc; and

5 a control unit operable to control the writing unit,  
wherein

the control unit

- (a) controls the writing unit to write the video object onto the data area of the optical disc,
- 10 (b) generates a table showing recording addresses of data units, the addresses corresponding to a plurality of reproduction times that belong to a period during which the video object is reproduced, each of the data units containing a picture to be reproduced at a corresponding one of the plurality of reproduction times,
- 15 (c) controls the writing unit to write the table into the time map area of the optical disc,
- (d) generates a plurality of sets of cell information, each of which includes a start time and an end time which are used to identify a reproduction section in the video object, and
- 20 (e) controls the writing unit to write the plurality of sets of cell information onto the program chain area of the optical disc so as to correspond to reproduction orders.

25 4. The recording apparatus of Claim 3, wherein

the table further records difference times, each of which corresponds to one of the plurality of reproduction times and is a difference between the one of the plurality of reproduction times and a reproduction time of the first picture of a data unit that includes a picture to be reproduced at the one of

the plurality of reproduction times.

5. A recording method for use in a recording apparatus for recording onto an optical disc a video object containing a 5 plurality of data units, each of which contains at least one picture, the recording method comprising the steps of:

writing data onto a data area of the optical disc;

generating a table showing recording addresses of data units, the addresses corresponding to a plurality of 10 reproduction times that belong to a period during which the video object is reproduced, each of the data units containing a picture to be reproduced at a corresponding one of the plurality of reproduction times;

writing the table onto a time map area of the optical disc;

15 generating a plurality of sets of cell information, each of which includes a start time and an end time which are used to identify a reproduction section in the video object; and

writing the plurality of sets of cell information onto the program chain area of the optical disc so as to correspond 20 to reproduction orders.

6. The recording method of Claim 5, wherein

the table further records difference times, each of which corresponds to one of the plurality of reproduction times and 25 is a difference between the one of the plurality of reproduction times and a reproduction time of the first picture of a data unit that includes a picture to be reproduced at the one of the plurality of reproduction times.

30 7. A reproducing apparatus for reproducing the video object recorded on the optical disc defined in Claim 1, the reproducing

apparatus comprising:

a reading unit operable to read data from the optical disc;

5 a reproducing unit operable to reproduce the video object; and

a control unit operable to control the reading unit and the reproducing unit, wherein  
the control unit..

- 10 (a) receives an instruction to reproduce according to the plurality of sets of cell information,
- (b) controls the reading unit to read the table and the plurality of sets of cell information,
- 15 (c) refers to the read table and identifies, for each of the plurality of sets of cell information, a data unit that contains a picture corresponding to the start time and the end time, and
- 20 (d) determines reproduction sections in accordance with the identified data units and controls the reading unit and the reproducing unit to reproduce the determined reproduction sections in an order that is determined in accordance with the reproduction orders.

8. The reproducing apparatus of Claim 7, wherein

the table further records difference times, each of which

25 corresponds to one of the plurality of reproduction times and is a difference between the one of the plurality of reproduction times and a reproduction time of the first picture of a data unit that includes a picture to be reproduced at the one of the plurality of reproduction times.

30 9. A reproduction method for use in a reproducing apparatus

that includes (a) a reading unit operable to read data from the optical disc defined in Claim 1 and (b) a reproducing unit operable to reproduce the video object, the reproduction method comprising the steps of:

- 5 receiving an instruction to reproduce according to the plurality of sets of cell information,
  - controlling the reading unit to read the table and the plurality of sets of cell information,
  - referring to the read table and identifying, for each of
- 10 the plurality of sets of cell information, a data unit that contains a picture corresponding to the start time and the end time, and
  - determining reproduction sections in accordance with the identified data units and controlling the reading unit and the
  - 15 reproducing unit to reproduce the determined reproduction sections in an order that is determined in accordance with the reproduction orders.

10. The reproduction method of Claim 9, wherein
  - 20 the table further records difference times, each of which corresponds to one of the plurality of reproduction times and is a difference between the one of the plurality of reproduction times and a reproduction time of the first picture of a data unit that includes a picture to be reproduced at the one of
  - 25 the plurality of reproduction times.

11. A computer-readable recording medium recording a program for use in a recording apparatus, that records onto an optical disc a video object containing a plurality of data units, each
  - 30 of which contains at least one picture, the program allowing a computer to execute the steps of:

writing data onto a data area of the optical disc;  
generating a table showing recording addresses of data units, the addresses corresponding to a plurality of reproduction times that belong to a period during which the  
5 video object is reproduced, each of the data units containing a picture to be reproduced at a corresponding one of the plurality of reproduction times;

writing the table onto a time map area of the optical disc;

generating a plurality of sets of cell information, each  
10 of which includes a start time and an end time which are used  
to identify a reproduction section in the video object; and  
writing the plurality of sets of cell information onto  
the program chain area of the optical disc so as to correspond  
to reproduction orders.

15  
16 12. The computer-readable recording medium of Claim 11,  
wherein

17 the table further records difference times, each of which  
corresponds to one of the plurality of reproduction times and  
20 is a difference between the one of the plurality of reproduction  
times and a reproduction time of the first picture of a data  
unit that includes a picture to be reproduced at the one of  
the plurality of reproduction times.

25 13. A computer-readable recording medium recording a program  
for use in a reproducing apparatus that includes (a) a reading  
unit operable to read data from the optical disc defined in  
Claim 1 and (b) a reproducing unit operable to reproduce the  
video object, the program allowing a computer to execute the  
30 steps of:

receiving an instruction to reproduce according to the

plurality of sets of cell information,

controlling the reading unit to read the table and the plurality of sets of cell information,

referring to the read table and identifying, for each of  
5 the plurality of sets of cell information, a data unit that contains a picture corresponding to the start time and the end time, and

determining reproduction sections in accordance with the identified data units and controlling the reading unit and the  
10 reproducing unit to reproduce the determined reproduction sections in an order that is determined in accordance with the reproduction orders.

14. The computer-readable recording medium of Claim 13,  
15 wherein

the table further records difference times, each of which corresponds to one of the plurality of reproduction times and is a difference between the one of the plurality of reproduction times and a reproduction time of the first picture of a data  
20 unit that includes a picture to be reproduced at the one of the plurality of reproduction times.